DOCUMENT RESUME

ED 457 727 HE 034 376

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TITLE Analysis of Factors Influencing Employment Migration of Recent Degree Recipients. AIR 2001 Annual Forum Paper.
PUB DATE 2001-06-00
NOTE 20p.; Paper presented at the Annual Meeting of the Association for Institutional Research (41st, Long Beach, CA, June 3-6, 2001).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *College Graduates; Degrees (Academic); *Employment Patterns; Graduate Surveys; Higher Education; *Migration Patterns; Prediction; Residential Patterns

ABSTRACT

Two graduate follow-up studies were analyzed for factors predicting likelihood that a graduate would stay in-state or migrate out-of-state. Slightly more than half of the bachelor's degree recipients from the class of 1993-1994 were included in the first sample, and responses were received from 522 graduates. In the second survey, 717 graduates answered questions related to employment. Results indicate that the factors of work characteristics and environmental situations and original student source were significant in predicting the location of the student's first job after graduation. The graduate's academic discipline did not contribute to the predictability of migration. The study also found that graduates who took their first job out-of-state earned, on average, higher average salaries, even though pay was not a reported factor in predicting migration. Although students who came to the institution from out-of-state were more likely to migrate, only 38% of these students returned to their home state after graduation. Results of this study suggest that all students (from both in-state and out-of-state) graduate into a global marketplace, and decisions that they make to migrate or remain in-state may be based on the global players that offer them opportunity first. If a state wants to retain more of its graduates, it should put more focus on recruiting and developing economic opportunities for this skilled workforce. (Contains 10 tables and 23 references.) (SLD)

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ED 457 727

Analysis of Factors Influencing Employment Migration Of Recent Degree Recipients

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Paper presented at the 41st Annual Forum of the Association for Institutional Research

Long Beach, California

June 3 – 6, 2001

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Analysis of Factors Influencing Employment Migration Of Recent Degree Recipients

Abstract

Two graduate follow-up studies were analyzed for factors predicting likelihood that a graduate would stay in-state vs. migrate. Results indicated that the factors of work characteristics and environmental situations (Thomas & Dunkelburger, 1991) as well as original student source were significant in predicting location of first job after graduation. The graduate's academic discipline did not contribute to the predictability of migration. The study also found that graduates who took their first job out-of-state earned higher average salaries, even though pay was not a reported factor in predicting migration. Although students who came to the institution from out-of-state were more likely to migrate, only 38 percent of these students returned to their home state after graduation. Results of this study suggest that all students (both in-state and out-of-state) graduate into a global marketplace and decisions that they make to migrate or remain in-state may be largely based upon which global players offer them opportunity first. In short, if a state wants to retain more of its graduates, it should put more focus on recruiting and developing economic opportunities for this skilled workforce.

I. INTRODUCTION

Public institutions of higher education play an important role in the economic development of a state. The investment of state funds can be returned to the state's economy if degree recipients remain in that state for employment after graduating, or if their migration to other states is matched by an influx of degree recipients migrating in from other states with credentials that are relatively the same or exceed those of graduates migrating outward. However, looking beyond the local economic impact of college graduates, out-migration can be an indicator that an institution's graduates are capable of competing in a global market. Furthermore, large percentages of out-migration could simply be a reflection of the lack of economic opportunities found in the institution's home state.

Investigation of reasons for employment migration provides opportunities to create and maintain incentives that prevent public college and university graduates from migrating to other states. An example of existing incentives can be found in Georgia's Helping Outstanding Pupils Educationally (HOPE) Scholarship, which offers tuition to teachers earning advanced degrees in education. Recipients commit to teach in Georgia for a designated number of years, determined by the amount of financial assistance received. Incentives like this provide tangible models for other states. Therefore, it becomes important for institutional researchers in higher education to be involved in employment migration studies. Longitudinal analysis of migration trends is indicated. Of particular interest is the influx and subsequent employment of talented out-of-state students.

Employment migration, the movement of graduates away from the state in which they received their degree, reveals little research directed toward its causes and long-term effects on state economic development and funding for public colleges and universities. A variety of studies taken from different universities' offices of institutional research and admissions/enrollment management provide some unique comparisons. Through recent data obtained through an institutional research office of a large southern research university, in addition to a literature review of follow-up surveys conducted by other institutions, the need for studies by state institutions of higher education and educational agencies is shown in this report.

II. LITERATURE REVIEW

It is of great importance for a state to retain as many of its graduates as possible after preparing them for entry into the workforce. Retention of graduates holding degrees and credentials directly applicable to specific occupational needs of the home state should be considered a higher priority than those with less applicable skills and/or fields of expertise. A report compiled by the Southern Technology Council, *Where Have All the Students Gone? Interstate Migration of Recent Science and Engineering Graduates*, stated that graduates of science and engineering curricula "can make huge contributions to state and national economies, both in terms of human resources for existing high-tech businesses and often as entrepreneurs creating new businesses and new jobs." (STC, 1998, p. 21) Research analysts in this report concluded that higher wages and urbanized areas in the technology sector of employment are positively correlated with graduate migration. Urban areas offer employment prospects for professional and technical personnel that stimulate migration of individuals with lucrative skills and training that are in high demand (Ferris, 1973, p.21).

There is evidence that southern states may be effectively retaining agriculture students. Ballweg and Droz (1991) reported that 65 percent of agricultural graduates in southern states took their first jobs in the same state in which they earned their degrees. However, retention rates dropped over the years, as many eventually migrated outward.

Studies conducted by other institutions report percentages of graduates remaining in-state as:

- 77% (class of 1990-91) - Michigan four year colleges (Scheetz & Gardner,1993)
- 79% (class of 1988-89) to 91% (class of 1994-95) - University of Illinois, (UIOPB,1998)
- 60% (class of 1988-89) to 77% (class of 1994-95) - University of Illinois, Urbana-Champaign (UIOPB, 1998)
- 94% (39 of 66 respondents) for civil, electrical and mechanical engineering graduates (class of 1993)-University of Hawaii-Manoa (UHM-CPS, 1993)

Additionally, North Carolina State University surveyed its December 1990 through August 1993 baccalaureate degree recipients showing that 82 percent of alumni classified as in-state students remained in North Carolina. Additionally, 38 percent of out of state students remained in North Carolina upon graduation (NCSU-OPA, 1993). Researchers from North Carolina State University confirmed the positive results of this survey by stating that NCSU is providing "the great majority of in-state students

[with] the knowledge and skills they need to [secure] meaningful professional employment in North Carolina." There is also the possibility that this region, including the research triangle of North Carolina, is providing opportunities that best fit technical skills of college graduates, a characteristic that has been identified as a motivation for job choice of college graduates (Ballweg & Li, 1991). Other studies report smaller in-state retention percentages. A University of Oklahoma study found that 51% of in-state residents were planning to stay in Oklahoma after graduation in 1999 (McCauley, 1999).

There are statewide studies available which look at migration specific to needs of the state (Indiana Commission for Higher Education, 1995; Scheetz & Gardner, 1993). For example, a study conducted by the Indiana Commission for Higher Education on a 1990-91 graduating class shows that the discipline areas that retain the highest proportion of graduates are Trade and Industrial Arts, Liberal Arts and Education, while the smallest proportion of graduates retained are in the areas of Engineering-related studies, and Language Arts (Indiana Commission for Higher Education, 1995). There is also evidence that large numbers of post-baccalaureate graduates (61%) tend to find jobs in the state of the institution (Oregon State System of Higher Education, 1991). The Indiana Commission on Higher Education (1995) found similar results.

Variables Associated with Student Migration

Although not investigated in this study, there are some personal characteristics that may motivate employment migration away from the region of a college/university, such as: lack of family attachment (Sanchez, 1992) and a history of past mobility (Jacobs & Koeppel, 1974). There are also personality traits that have shown to be related to migration such as: the need for power and achievement (Boneva, Frieze, Pauknerova & Orgock, (1998) and sensation seeking (Jacobs & Koeppel, 1974). Likewise, an internal locus of control (Rotter, 1969) (described as the perception that events are determined by an individual's own behaviors rather than fate, luck or external circumstances) shows a positive relationship with mobility (Hines, Koeppel & Jacobs, 1982). There are researchers that believe some individuals have a genetic tendency to be mobile, looking for new experiences and places, regardless of economic factors (Jordan-Bychkov & Domosh, 1999). Additionally, age and gender impact migration patterns.

Older graduates are more likely to migrate than younger graduates, and male graduates are more likely to accept jobs in-state than are female graduates (Balweg & Li, 1991).

Ballweg & Li (1991) have contributed research to student migration, investigating characteristics of the job that may predict movement away from the state in which the degree was received. In this sample of southern land grant university students, statistical results (Table 4, pg. 9) revealed that students that migrated showed significantly higher concerns for the following: challenges and importance of the work, opportunities to use education and skills, chance for advancement and travel opportunities. Additionally, students that migrated showed less concern for the location of the job. Similar results were found in another study using the same instrument, indicating the following items as being either "very important" or "important" to graduates: opportunity to develop new skills (77.1 percent); challenges of work (76.5 percent); opportunity to use my education (67.8 percent); and chances for advancement (60.3 percent) (Thompson & Brown, 1991, pg.8). The 16 factors utilized for this study originated from the consensus of a committee that investigated the migration of southern agriculture graduates (Thomas & Dunkelburger, 1991). The sixteen factors were combined into three indexes describing reasons for accepting first job: work characteristics, environment situations and economic factors.

A follow-up study to an influential 1998 report, "Where Have All the Students Gone?"(Southern Technology Council, 1998) also conducted by the Southern Technology Council (Tornatzky, Gray, Tarant & Zimmer, 2001) looks at state source, GPA average, discipline area, type of institution and salary as predictors of migration. It found that for engineering and science graduates, "...the odds of an individual taking a job in-state are shown to increase more than tenfold if the individual stays in the same state they went to high school in to attend college (Tornatzky, et al., 2001, pg.5)." Predictors decreasing odds of being employed in-state were: high grade point averages, graduating in engineering and physical sciences, above average salary, graduating from a research-intensive institution, graduating from a historically black college or university.

III. ANALYSIS OF GRADUATE FOLLOW-UP SURVEYS

An institutional research office of a large southern research university compiled data from follow-up surveys of recent degree recipients that were conducted every two years. This feedback is sought for the specific purpose of collecting data on graduates' experiences at the university, and the directions in which their professional or academic lives have gone. The follow-up surveys investigated for this study targeted baccalaureate degree recipients from three classes: 1993-94 and a combined sample of 1995-96 and 1996-97. Several items on these surveys corresponded directly to employment migration. Survey items, "In what state was your first job?" and "In what state is your current job?" were included on the survey as well as questions designed to determine influential factors in acceptance of the first job.

Additionally, in an attempt to replicate the findings of Ballweg & Li (1991) for graduates from this southern research university, the 16 factors that comprise three indexes (economic factors, work characteristics, environmental situations) were investigated as reasons for migration, along with actual reported salary on both samples. In a study of the 1993-94 graduating class, logistic regression determined the best predictor variables for migrating out among the following variables: economic factors, work characteristics and environmental situations. Reported salary was added in a revised regression model. Logistic regression can be used when there is a dichotomous dependent variable (Hair, Anderson, Tatham & Black, 1992). The estimated coefficients become measures of the changes in the odds ratios. If coefficients are significantly positive, the odds ratio of an event occurring will increase; if the coefficients are significantly negative the odds of the event occurring will decrease (Hair et al., 1992). This was followed up with independent t-tests on the 16 factors to determine significant mean differences between those that remain in-state and those that migrate.

A second study was also conducted in April 2001 on more recent graduating classes (1995-96 and 1996-97, combined) attempting to investigate new findings reported by the Southern Technology Council (Tornatzky, et al., 2001). Thus, the regression model for this latest graduating class (1995-96, 1996-97) included the predictors of source or home state, the three indexes previously included in the first study (work characteristics, environmental situations, economic factors) and actual reported salary. Attempts

were made to investigate discipline area as a predictor. However, no model fit, with statistical significance, could be found for this population.

Results of First Study (1993-94 Graduating Class)

Slightly more than half of the 3,989 bachelor's degree recipients from the class of 1993-94 were included in the sample group (2,102). Of those, 522 responses were received, producing a response rate of 26 percent. Literature shows typical response rates of alumni surveys to range from 21 – 50% (Banta, 1993). The distribution of demographic variables closely reflected those of the student body by gender, ethnicity and college or school of enrollment. There were only 458 responses to the questions concerning employment.

The most favorable results showed that slightly more than 63% of in-state students indicated that they remained in-state for their first job (see Table 1) Additionally, there was an influx of 24% of out-of-state students who remained in in-state.

Table 1

Admissions Residency & Sate of First Job: Graduate Follow-Up Survey, 1993-94 Graduating Class

	Admissions Residency		
State of first job	Out-of-state	In-state	Total
Out-of-state	130	105	235
In-State	42	181	223
Total	172	286	458

63.3% of in-state graduates took their first job in-state.

Admissions Residency & State of Current Job
Graduate Follow-Up Survey

	Admissions Residency		
State of current job	Out-of-state	In-state	Total
Out-of-state	126	99	225
In-State	29	169	198
Total	172	268	423

59.1% of in-state graduates took their current job in-state

The potential skills that were gained and lost by the migration, both in-state and out-of-state, of this sample of graduates can be seen in Table 2.

Table 2

Comparison of Losses of Instate Students to Gains of Out-of-State Students, Graduate Survey Data 1993-94 Graduating Class

Out-Of-State Students Taking Jobs In-state Total Number = 42	**In-State Students** Taking Jobs Out-of-state Total Number = 105
33% Liberal Arts and Human Sciences	31% Engineering/Sciences & Math
24% Teaching	23% Business
21% Engineering/Sciences & Math	16% Liberal Arts and Human Sciences
10% Business	15% Teaching
5% Agriculture & Forestry	7% Agriculture & Forestry
7% Architecture	2% Nursing
0% Nursing	3% Pharmacy
0% Pharmacy	

Even though it appears that the influx of degree recipients migrating in from other states may not equal credentials of graduates migrating outward, the value of this influx can be seen by examining the professional skills provided to this state by these out-of-state students (see Table 3).

Table 3

Careers of Out-Of-State Students Remaining In-State, Graduate Survey Data, 1993-94 Graduating Class

Careers In-State	**Percentage**
Management Occupations	26.6
Communication Professionals	21.4
Mental Health Professionals	12.0
Teaching Professions	12.0
Sales	9.5
Public Safety	4.8
Legal Professionals	4.8
Computer and Information	2.4
Other	4.8

Looking at total responses (regardless of source) to questions concerning employment reveals that 48.7% (223 of 458) of graduates indicated that they remained in-state for their first job. There is some additional loss, although minimal, over time as the respondents accept future jobs (from 48.7% to 46.8%) (see Table 1).

Results from this baccalaureate survey were fairly similar to those of Ballweg's and Li's (1991) research findings as both appeared to support work characteristics and environmental situations as more influential factors than economic factors as predictors of first job acceptance. Ballweg and Li (1991) found a higher number of individual factors that showed a statistically significance difference between students that remained in-state and those that migrated (see Table 4).

TABLE 4:

Employment Migration Among Graduates of Southern Land-Grant Universities, Graduate Survey Data, 1993-94 Graduating Class

Comparison of Mean Importance Scores in Accepting First Job In-State and Out-of-State Among Graduates				
Factors	In-State	Out-of-State	Grand Mean	Significance
Economic Factors				
Pay	2.69	2.76	2.72	0.264
Fringe benefits	2.54	2.63	2.57	0.202
Security of job	3.07	3.02	3.05	0.448
Work Characteristics				
Challenges of work	3.76	4.08	3.87	0.000 *
Importance of work	3.50	3.82	3.61	0.000 *
Respect people have for this kind of work	2.63	2.66	2.64	0.642
Opportunity to use my education	3.54	3.75	3.61	0.004 *
Opportunity to develop new skills	3.83	4.13	3.94	0.000 *
Chance for advancement	3.29	3.64	3.41	0.000 *
Opportunity to travel	1.83	2.24	1.97	0.000 *
Environmental Situations				
Working conditions	3.23	3.32	3.26	0.159
Good work associates	2.99	3.14	3.05	0.039
Job as a whole	3.52	3.04	3.35	0.000 *
Location of job	3.52	3.04	3.35	0.000 *
Worker independence				
Chance to be my own boss	2.38	2.29	2.35	0.194
Amount of supervision	2.67	2.68	2.67	0.970

From Ballweg & Li. (1991, April) *Employment Migration Among Graduates of Southern Land-Grant Universities*. Atlanta, GA: Presentation at the Southern Sociological Society. (ERIC Document Reproduction Service No. ED 330 514)

* Statistically significant, $p < .05$

Results from the logistic regression model in this first study supported the significance of work characteristics and environmental concerns in predicting migration. Put simply, higher concerns about work characteristics (such as opportunities to travel, use of education, challenges) and less concerns about the environment of the job (such as location of job and working conditions) increase the odds of migration. The dependent variable was categorical with moving = 1 and not moving = 0. Two models were examined. The first model included the student-reported characteristics that were influential in accepting their first jobs. The second model added the actual reported salary to the prediction.

In Model 1 (without regard to reported salary), work characteristics and environmental concerns were significant in predicting migration (see Table 5). The model shows that concern for work characteristics of first jobs had a positive impact on the prediction of migration with a coefficient of .4532 ($p<.01$). Environmental concerns decreased the probability of moving with a coefficient of -.3897 ($p<.05$).

Table 5:

Logit Regression of Coefficients of Migration – 1993/94 Graduating Class

	Model 1		Model 2	
	Regression Coefficients		Regression Coefficients	
	Standard Error	Coefficient	Standard Error	Coefficient
Predictors				
Work Characteristics	0.1724	.4532 *	0.17470	0.46050 *
Environmental Situations	0.1625	.3897 **	0.16490	0.38630 **
Economic Factors	0.1221	-.1080	0.13010	-0.22700
Salary			0.000004	0.000001 **
Goodness of Fit = .4270			Goodness of Fit = .8806	
Overall Prediction = 57.08%			Over all Prediction = 57.56	

* Statistically significant, $p < .01$
**Statistically significant, $p < .05$

Economic concerns were not significant in predicting migration. However, when examining Model 2 (see Table 5) the reported salary of students had a positive impact on migration, even though the students reported that economic factors did not influence their decision. Ballweg and Li's (1991) explanation of this finding could fit this population. "The salary, while not described by the graduate as key to the decision [to migrate], tends to be higher because it provides a better match with work related characteristics and the skills the new worker brings to the job." (Ballweg & Li, 1991, p.9).

Hosemer and Lemeshow goodness of fit (.88) indicated the revised model fit the data. Additionally, acceptable Cronbach's alpha for three indexes ranged from .68 to .80 with inter-item correlations ranging from .14 to .56. The worker independence items (see Table 6) were factored in as work characteristics for this study as well as the Ballweg & Li (1991) study, which may have impacted inter-item correlation, an issue that was addressed in the second study.

Looking at the follow-up t-tests, there was a significant difference in responses between students migrating versus those taking their first jobs in-state for two variables: opportunity to travel and location of job (see Table 6). For graduates who took jobs in-state, location of job was a more important factor in their decision to accept their first job. For those who took their first job out-of-state, opportunity to travel was a more important factor in their decision to accept their first job. However, the means for opportunity to travel indicate that this factor was ranked low in importance for both groups relative to other factors. Therefore, for those students that took their first jobs out-of-state, the work characteristic of opportunities to travel was less unimportant.

TABLE 6:

Employment Migration Among Graduates: Graduate Follow-up Survey – 1993-94 Graduating Class

Comparison of Mean Importance Scores in Accepting First Job In-State and Out-of-State Among Graduates

Factors	In-State	Out-of-State	Grand Mean	Significance
Economic Factors				
Pay	2.53	2.55	2.54	0.879
Fringe benefits	2.55	2.67	2.61	0.292
Security of job	2.49	2.64	2.57	0.229
Work Characteristics				
Challenges of work	2.22	2.09	2.15	0.214
Importance of work	2.21	2.24	2.22	0.786
Respect people have for this kind of work	2.89	3.00	2.95	0.370
Opportunity to use my education	2.02	2.11	2.07	0.422
Opportunity to develop new skills	2.03	1.97	2.00	0.524
Chance for advancement	2.46	2.34	2.40	0.364
Opportunity to travel	3.93	3.49	3.71	0.001 *
Environmental Situations				
Working conditions	2.22	2.40	2.31	0.106
Good work associates	2.67	2.68	2.68	0.922
Job as a whole	1.89	1.91	1.90	0.890
Location of job	1.87	2.21	2.05	0.001 *
Worker independence				
Chance to be my own boss	3.33	3.29	3.31	0.714
Amount of supervision	3.41	3.31	3.36	0.402

* Statistically significant, $p < .05$

Results of Second Study (Combination of 1995-96 and 1996-97 Graduating Classes)

A second study was conducted in April 2001 on a sample of students (n = 3763), which is more than half of the 1995-96 and 1996-97 graduating classes. The response rate to this survey was approximately 22.3% (n = 838). Only 717 students answered questions concerning employment. The distribution of demographic variables of the sample closely reflected those of the student body by gender, ethnicity and college or school of enrollment. In an effort to improve on prediction, based upon recent research (Tornatzky, Gray, Tarant & Zimmer, 2001), home state was entered into the logistic regression equation first, followed by: a dummy variable indicating degree in engineering/physical science, work characteristics index, environmental situations index, economic factors index, and finally salary. The Logistic Model was revised for best fit to include home state, work characteristics, environmental situations, economic factors and salary. Specific discipline areas did not predict migration of graduates with any significance for this population. Testing the model proposed by the Southern Grown Policy Board (Tornatzky et al., 2001), this study found that graduates were not less likely to be employed in-state if they graduated in engineering or physical sciences. However, results did support that the odds of a

student migrating are increased if they came from out-of-state, are concerned with work characteristics (in particular, chance for advancement), and command a higher salary. The percentage (65%) of in-state students that did not migrate remained high for this study (see Table 7).

Table 7:

Admissions Residency & State of Job, Graduate Follow-Up Survey 1995-96 and 1996-97

State of First Job	**In-State**	**Out-of-State**	**Total**
In-State	282	56	338
Out-of-State	153	226	379
Total	435	282	717

65% of in-state residents took their first job in-state.

State of Current Job	**In-State**	**Out-of-State**	**Total**
In-State	258	32	290
Out-of-State	141	232	373
Total	339	264	663

65% of in-state residents took their current job in-state.

The dependent variable for the logistic regression model was categorical with moving = 1 and not moving = 0. Hosemer and Lemeshow goodness of fit (Table 8) was acceptable for the final model (.34) with significance found ($p<.001$) for the coefficients of home source (1=in-state, 0=out-of-state), along with work characteristics ($p<.05$) , and for salary ($p<.05$).

Table 8:

Logit Regression of Coefficients of Migration, Graduating Classes 1995-96 and 1996-97

	Model 1 Regression Coefficients		**Model 2** Regression Coefficients	
	Standard Error	Coefficient	Standard Error	Coefficient
Predictors				
Home State	0.1856	-2.7100 *	0.18420	-2.0480 *
Eng/Phy. Sci. Graduate	0.4903	0.2343		
Work Characteristics	0.1513	0.3674 *	0.15080	0.3808 **
Environmental Situations	0.1495	-0.1960	0.14870	-0.2148
Economic Factor	0.1083	-0.0879	0.10770	-0.0992
Salary	0.0001	0.0001 *	0.00001	0.0001 *
Overall prediction = 71.55%			Overall prediction = 71.55%	
Goodness of Fit = .1726			Goodness of Fit = .3423	

* Statistically significant, $p < .001$
** Statistically significant, $p < .05$

The work characteristics index was revised for greater inter-item correlations removing the characteristic of worker independence from the scale. Cronbach's alpha = .81 with inter-item

correlations ranging from .38 to .70. Significant t-tests were found between responses from students remaining in-state and those migrating, for the individual characteristics of: chance for advancement, opportunity to travel and location of the job (see Table 9).

TABLE 9:

Employment Migration Among Graduates of Second Study, 1995-96 and 1996-97

Comparison of Mean Importance Scores in Accepting First Job In-State and Out-of-State Among Graduates

Factors	In-State	Out-of-State	Grand Mean	Significance
Economic Factors				
Pay	3.41	3.38	3.40	0.750
Fringe benefits	3.25	3.29	3.27	0.623
Security of job	3.44	3.38	3.41	0.548
Work Characteristics				
Challenges of work	3.76	3.87	3.81	0.198
Importance of work	3.84	3.82	3.83	0.814
Respect people have for this kind of work	3.16	3.03	3.09	0.185
Opportunity to use my education	4.01	3.96	3.98	0.594
Opportunity to develop new skills	4.03	4.17	4.10	0.056
Chance for advancement	3.52	3.74	3.63	0.028 *
Opportunity to travel	1.99	2.40	2.19	0.000 **
Environmental Situations				
Working conditions	3.54	3.63	3.58	0.289
Good work associates	3.35	3.34	3.34	0.869
Job as a whole	4.12	4.13	4.12	0.886
Location of job	4.15	3.83	3.99	0.000 **
Worker independence				
Chance to be my own boss	2.61	2.60	2.61	0.982
Amount of supervision	2.72	2.63	2.67	0.356

** Statistically significant, $p < .001$
* Statistically significant, $p < .05$

IV. DISCUSSION

The results of Ballweg and Li's (1991) research on agricultural graduates' first employment, compounded with the results from these studies of baccalaureate recipients, provide a foundation for predicting the factors most likely to influence employment migration and show opportunities for retaining out-of-state students. It is apparent from the findings of these studies that recent graduates are likely to be most receptive to jobs centered on work characteristics, rather than solely on economic factors such as salary and benefits. This concern for work characteristics was a predictor even after factoring in source state upon entry into the institution (in the second study). However, this focus on finding jobs that match work characteristics for those that migrate is accompanied by higher salary. Although "location of job" was a predictor factor for students that migrate, concern for location of the job decreased the odds of a student migrating, for this population. Also significant to these findings is evidence that of the out-of state students that migrated (in the first study), less than half of them returned to their home state.

While coming to the institution from out-of-state predicts migration, as found in this study, one must be careful not to assume that these same students tend to return to their home states. Examining all students who originated from out-of-state to attend college, only 38% returned to their home states. There is support for this finding in a study conducted at Oklahoma University, showing that only 31% of out-of state students in a 1999 graduating class returned to their state or country of origin (McCauley, 1999). The fact that less that half of the migrating out-of-state students returned home, along with this group's lesser concern for location of employment, presents some very real opportunities to recruit and retain these students in-state and benefit the state's economy. Out-of-state students have left home and possibly adjusted, therefore returning home may not be of significant importance. However, this research suggests that to retain these students, a state must present work opportunities that match the importance of work characteristics for these graduates, such as opportunities to travel, challenging work, opportunities to use education, development of new skills, with chances for advancement.

Since discipline areas at this institution do not significantly predict migration as recently shown by Tornatzky, et. al, (2001), all graduates, technical and non-technical, represent potential human capital for a state that is looking to enhance its economic development. Therefore, all graduates, regardless of

field of study, may be willing to seek employment in-state. With this in mind, examination of gains as well as losses by discipline area can provide some unique information to the state's stakeholders. For example, this study shows that credentialed or licensed fields such as pharmacy, nursing and teaching have a high rate of retention in the state (Table 10). These fields may have a national norm for salaries and benefits that puts them on an even playing field in terms of retaining graduates. Additionally, students in these areas typically have in-state internships that may lead to post-baccalaureate employment. Increasing out-of-state enrollment for these areas may be of some benefit to the state, particularly if there are shortages within the fields. Also notable is that forestry graduates are retained at a high rate in a state where the forestry industry is the state's leading contributor to the gross state product (Bliss, 1995). Economic need within a state impacts the amount of migration among graduates. This study suggests that as the state develops its economy, more graduates will remain in-state.

Table 10

Location of First Job of by College/School: Graduating Class 1995-96 and 1996-97

College/School	In-State	%	Out-of-State	%
Agriculture	14	58.3	10	41.7
Architecture	17	43.6	22	56.4
Business	58	37.7	96	62.3
Education	61	59.2	42	40.8
Engineering	48	40.3	71	59.7
Forestry	14	63.6	8	36.4
Human Sciences	14	38.9	22	61.1
Liberal Arts	68	45.9	80	54.1
Nursing	12	63.2	7	36.8
Pharmacy	18	94.7	1	5.3
Sciences and Math	14	41.2	20	58.8
Total	338	47.1	379	52.9

Future employment migration research should focus on job recruitment opportunities available to students on, or through, the campus. The majority (55% for this study) of graduates indicated that the most helpful factor in finding their first job took place through activities of the university (including placement services, co-op experiences, internships, job fairs, faculty contacts, etc.). Looking at the number of opportunities to meet with in-state employers in comparison to those coming from out-of-state may prove to be an important factor in predicting migration of graduates. Today's students graduate into a global marketplace and decisions that they make to migrate or remain in-state may be largely based on

which global players offer them opportunity first. In short, if a state wants to retain more of its graduates, it should put more focus on recruiting and developing economic opportunities for this skilled workforce.

Research on employment migration can assist administrators and regional planners in developing marketing strategies to recruit or retain talented graduates, by predicting those aspects deemed most influential by survey respondents and using that information to make informed decisions. Although retention rate of degree recipients of this study was lower compared to survey results from some other studies, it is recommended that further analysis incorporate regional statistics. Use of institutional research data such as this extends far beyond the "ivory towers" of academia to stakeholders in the private, public and non-profit sectors struggling to recruit or maintain an educated workforce. This type of research would increase accountability to customers of public institutions of higher education such as major industries, while showing the need to step up recruiting efforts in-state.

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